

## SYSTEMATIC NOTES AND GENERIC PLACEMENT OF *UTACAPNIA NEDIA* (PLECOPTERA: CAPNIIDAE)<sup>1</sup>

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**ABSTRACT:** The collection of additional specimens of *Utacapnia nedia* is reported. The female is described for the first time and additional morphological information based on fresh adult material is presented for the male along with illustrations of both sexes. The species is transferred to the genus *Utacapnia* and justification is given along with notes regarding tentative phylogenetic relationships of the species to others in the genus. A discrepancy in the original type locality is noted and additional distributional data presented.

Nebeker and Gaufin (1966) described *Capnia nedia* based on a single, teneral male removed from its nymphal exuvium. Excellent figures of the specimen were produced from which an accurate species identification could be made. Despite good illustrations and examination of the holotype, questions still existed regarding the validity and identity of this species. The epiproct of capniids curves over the dorsum of the terminal abdominal segments with the apex directed anteriorly. In mature male capniid nymphs the epiproct is visible through the nymphal skin with the apex projecting posteriorly. Since the only specimen of *C. nedia* had been removed from its nymphal exuvium and had a short, triangular epiproct bearing two openings, an interpretation of the adult orientation of the epiproct was confusing. Additionally, the tip of the epiproct appeared to be missing and the configuration of the epiproct and dorsum of the abdomen were not congruent with any of the morphologically defined species groups of North American *Capnia*. Fortunately, specimens of this species were collected despite misleading type locality information. Adult epiproctal orientation was examined and found to be most similar to that of the genus *Utacapnia*. Specimens reported in this paper are deposited in the insect collection at Brigham Young University and the Smithsonian Institution.

### *Utacapnia nedia* (Nebeker and Gaufin) new status.

*Capnia nedia* Nebeker and Gaufin 1966: 36. Nebeker and Gaufin, 1967: 418. Nebeker and Gaufin, 1968: 3. Baumann, Gaufin, and Surdick, 1977: 73.

**Male holotype:** IDAHO, Boise Co., Boise, Sand Creek, 8 April 1961, Max Ollieu, (USNM). A discrepancy in this reported type locality exists, Boise, Idaho is in Ada County, not Boise County. Examination of several maps including Boise and Ada counties failed to

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find any creeks named Sand Creek. Several Boise residents were questioned as to knowledge of any Sand Creek in that area and all responses were negative. However, searching creeks in these counties resulted in the collection of this species from several locations.

**Description of female:** body length 7.2 - 8.0 mm; macropterous, length of forewing 7.4 - 8.2 mm; body color black with light intersegmental membranes; subgenital plate darkened, heavily sclerotized, posterior margin modified into an angular projection overhanging posterior margin of sternum eight; anterior margin of sternum eight with medial membranous area, posterior margin of sternum eight formed as narrow band of sclerotization (Fig. 5).

**Redescription of male:** body length 5.6 - 7.2 mm; micropterous, length of forewing 0.4 - 1.0 mm; abdominal terga lacking knobs or projections (Figs. 1-2); epiproct length 0.4 - 0.6 mm, with openings at tip of epiproct and at apex of anterior declivity (Fig. 3) (for definition see Nelson and Baumann, 1987b); anterior declivity bearing pair of short projections near apex.

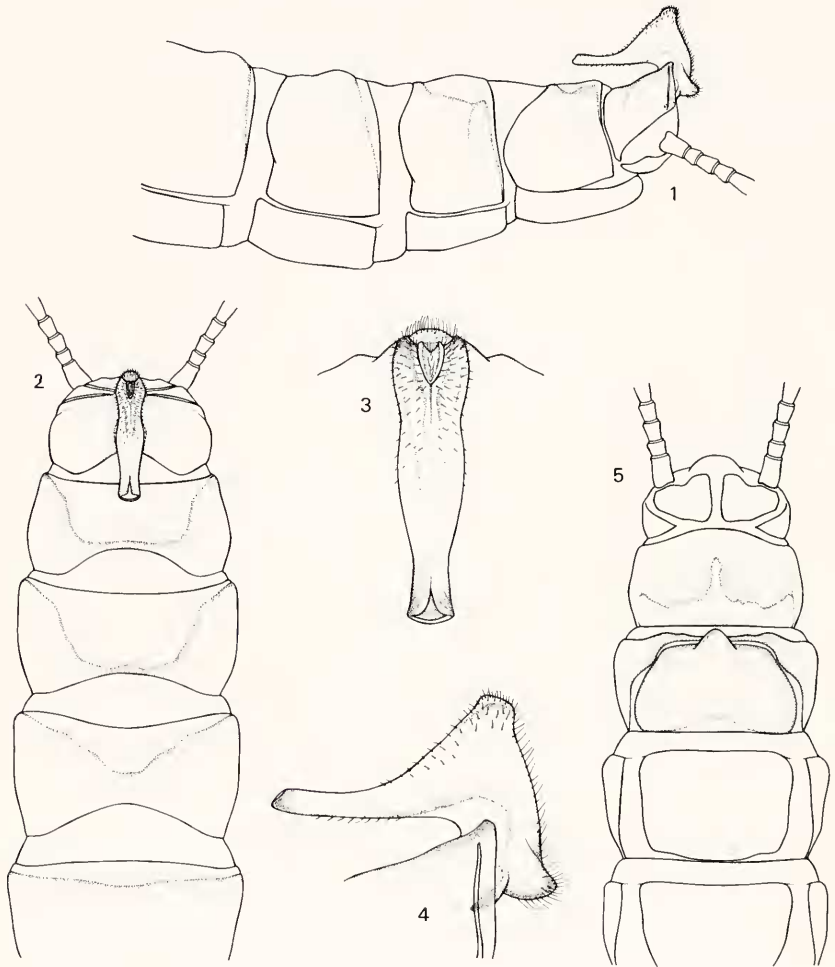
**Diagnosis.** The male of *U. nedia* may be readily separated from the genus *Capnia* by having two openings in the epiproct, one at the apex of the lower limb and one at the base of the anterior declivity. *Capnia* males have a single opening either at the apex of the epiproct or represented by a slit on the upper surface of the epiproct. The female can be separated from those of *Capnia* and *Capnura* by the presence of a heavy, darkly sclerotized subgenital plate, with the apex of the hind margin overhanging the posterior margin of sternum eight. The males of *Utacapnia* (including *U. nedia*) are separated from *Capnura* (Nelson and Baumann, 1987a) by the lack of dorsal knobs on the abdominal terga. Males of *U. nedia* are distinguished from all other species of *Utacapnia* in having an epiproct consisting of a single limb (homologous to the lower limb of other *Utacapnia* males). The female of *Utacapnia nedia* differs from others in the genus in having the projecting hind margin of the subgenital plate entire, not bifid as in *U. lemoniana* or irregular as in *U. logana*.

**Distribution.** IDAHO, Ada Co., Cottonwood Creek, 11 February 1985, A. Allen, 2 males; Cottonwood Creek, Mountain Cove Road, 1 mile inside Boise City limits, 2 March 1985, K. and A. Allen, 3 males; Washington Co., Manns Creek Reservoir, 1/4 mile N of mouth, 3 March 1985, E.M. Coombs, 1 female; Monroe Creek bridge, Highway 95, 4 mi N of Weiser, 3 March 1985, E.M. Coombs, 8 males and 3 females; OREGON, Malheur Co., 1 mile W of Bully Creek Reservoir, 9 March 1985, E.M. Coombs, 1 male. Total number of specimens examined, 18.

**Taxonomic notes.** This species appears to be a highly derived form of the genus *Utacapnia*. The members of this genus were reviewed by Nebeker and Gaufin (1965). Males of this species may be separated from the others in the key of Nebeker and Gaufin (1965) by inserting the following modified section in the place of couplet 5 on page 482:

- 5a. Upper supra-anal process (upper limb of epiproct) absent (Figs. 3 - 4, this paper) ..... *nedia* Nebeker and Gaufin  
 — Upper supra-anal process (upper limb of epiproct) present. .... 5b

- 5b. Upper supra-anal process slender with fan-shaped enlargement at tip; lower process nearly twice as long as upper..... 6  
 — Upper supra-anal process massive and deeply forked, forming two definite prongs; lower process one third longer than upper..... *lemoniana* (Nebeker and Gaufin)



Figures 1-5: *Utacapnia nedia* (Nebeker and Gaufin); 1. male terminalia, lateral view; 2. male terminalia, dorsal view; 3. epiproct, dorsal view; 4. epiproct, lateral view; 5. female terminalia, ventral view.

Females may be identified using this modified key section replacing couplet 3 on page 483 in Nebeker and Gaufin (1965):

- 3a. Posterior margin of subgenital plate irregular, usually bearing four points or lobes ..... *logana* (Nebeker and Gaufin)  
 — Posterior margin of subgenital plate regular, bearing one or two medial lobes ..... 3b  
 3b. Posterior margin of subgenital plate bearing single medial, darkly colored lobe (Fig. 5)  
 ..... *nedia* (Nebeker and Gaufin)  
 — Posterior margin of subgenital plate divided into two lobes, coloration of lobes variable...4

*Utacapnia* has been generally defined (Baumann, Gaufin and Surdick, 1977; Nebeker and Gaufin, 1965; Harper and Stewart, 1984) as capniids with males having an epiproct composed of two widely separated limbs paralleling each other with the upper limb more or less forked. Females in the genus have the subgenital plate with a striking color pattern and the posterior margin notched apically. The inclusion of *nedia* in the genus necessitates a change of these concepts. We view *Utacapnia* as capniids, the males of which have an epiproct with a broad base which bears a lower limb with a terminal membranous opening and often has the upper limb divided at the apex. Females have the medial portion of the subgenital plate heavily sclerotized and darkened with the posterior margin of the plate produced rearward over the hind margin of sternum eight. Couplet 50 in Harper and Stewart (1984) may be changed to read:

50. Epiproct of male usually divided into 2 slender processes often with upper process forked at tip (Fig. 13.159 of Harper and Stewart, 1984), or if epiproct composed of a single process (*nedia*) then apex of anterior declivity with short flanges and opening distinctly separated from that of epiproct tip; color of intersegmental membranes contrasting greatly with ground color of abdominal sclerites in fresh specimens; female sternum 8 with striking color pattern, its hind margin bearing 1-4 lobes ..... *Utacapnia*  
 — Epiproct of male usually simple, no flanges or separate opening on anterior declivity (Fig. 13.160 of Harper and Stewart, 1984); if not simple, processes are short, or tip of upper process not forked; female sternum 8 not as above ..... 51

Fresh specimens of the genus, both males and females, are dark black with intersegmental areas contrastingly light. Coloration varies from brown to black in *Capnia* and *Mesocapnia*; *Capnura* adults are generally dark brown to black. The males of *Utacapnia nedia* have an epiproct composed of a single limb which is homologous to the lower limb of other *Utacapnia*. This limb terminates in a membranous opening in both *nedia* and other members of the genus. The upper limb of *nedia* is reduced to an indistinct opening and two extremely short lateral flanges where the base of the upper limb joins the base of the epiproct. The forked feature of the upper limb is entirely absent in this species unless the short lateral flanges are homologous to the fork. No opening is apparent in the upper limb of *Utacapnia logana*

or *U. lemoniana*. The basal structure of the epiproct in *nedia* is heavy and broad as in *Utacapnia*, not slender as in *Capnia*. In brief, the morphology of the epiproct of *U. nedia* can be summarized as that of other *Utacapnia* with a shorter lower limb and a reduced upper limb.

**Phylogeny and Zoogeography.** It is beyond the scope of this paper to produce an overall phylogeny summarizing relationships of species in the genus *Utacapnia*. A few comments regarding the possible affinities of the anomalous *U. nedia*, however, are in order. This species bears shortened wings in the males which is considered apomorphic when compared with *Capnura* as an outgroup. This apomorphic state is also supported by comparisons to *Capnia* and *Mesocapnia*. The absence of the upper limb in *nedia* is interpreted as being an apomorphic reduction from the long, forked state that exists in the remaining members of the genus. The pointed unforked apex of the subgenital plate in the female is similar to that seen in some females of *U. logana* although the apex is more irregularly produced in the latter. The regular, unforked apex of the subgenital plate of *U. nedia* appears to be autapomorphic.

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